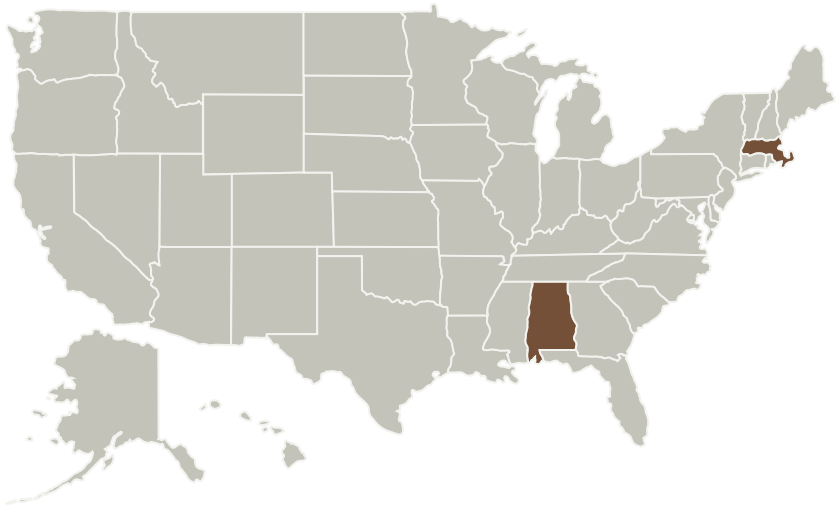
High Fidelity Line Diagnostics for the X-ray Astrophysics Recovery Mission

Completed Technology Project (2018 - 2020)

Project Introduction

We will provided a database of line diagnostic ratios for the X-ray Astrophysics Recovery Mission and other existing missions, with realistic, relevant uncertainty estimates, including for the first time preserving correlations between fundamental atomic parameters and the final line ratios. By generating for the first time realistic, physically motivate and properly energy dependent uncertainties on fundamental atomic data, with careful comparison to the existing experimental data, we will enable good diagnostics to be used with improved confidence while identifying those which turn out to be poorly constrained and should be avoided. We will release this data in the publicly accessible AtomDB database, complete with tools to create correlated line ratio estimates for instruments with arbitrary spectral resolution. This data will benefit all current and future X-ray missions, including XARM, Athena, Chandra and XMM-Newton in particular. The techniques are also expected to be applicable to non-X-ray spectra.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Science Mission Directorate (SMD)

Lead Organization:

Smithsonian Institution

Responsible Program:

Astrophysics Research and Analysis

Astrophysics Research And Analysis

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Organizations Performing Work	Role	Type	Location
Smithsonian Institution	Lead Organization	Industry	Washington, District of Columbia
Auburn University	Supporting Organization	Academia	Auburn, Alabama
Smithsonian Astrophysical Observatory(SAO)	Supporting Organization	US Government	Cambridge, Massachusetts

Primary U.S. Work Locations	
Alabama	Massachusetts

Project Management

Program Director:

Michael A Garcia

Program Manager:

Dominic J Benford

Principal Investigator:

Adam Foster

Co-Investigators:

Stuart D Loch
Jill Robidoux
Hans-werner Van Wyk

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.6 Ground Computing
    - TX11.6.7 High Performance Data Analytics Platform

Target Destination

Outside the Solar System